Attachment 1
Correspondence

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DATE	TO	FROM	REGARDING
8/27/09	Mr. Jay Warzinski Veolia Environmental Services	Mr. Joseph Lourigan Wisconsin Department of Natural Resources	E-mail requesting additional information – 8 rounds of groundwater data, and rising sulfate concentrations in 5 monitoring wells
6/26/09	Mr. Dennis Marshall RMT, Inc.	Mr. Joseph Lourigan Wisconsin Department of Natural Resources	E-mail requesting additional information – show private wells PW-4 and PW-8 on Figure 1-2 of the FR
6/5/09	Mr. Jay Warzinski Veolia Environmental Services	Mr. Joseph Lourigan Wisconsin Department of Natural Resources	E-mail requesting additional information – survey boundaries for Wetlands 6, 6A, and 7
4/23/09	Mr. Jay Warzinski Veolia Environmental Services	Mr. Franklin C. Schultz Wisconsin Department of Natural Resources	Letter of incompleteness for the proposed Southwest Expansion

To: "Jay.Warzinski@veoliaes.com" <Jay.Warzinski@veoliaes.com>
From: "Lourigan, Joseph J - DNR" <Joseph.Lourigan@Wisconsin.gov>
Date: 08/27/2009 05:38PM
cc: "Bekta, Ann M - DNR" <Ann.Bekta@wisconsin.gov>
Subject: EPL Issues

Jay,

I wanted to follow-up on our conversation on Tuesday about the groundwater data and the ACL calculations. As I indicated, I have spent a considerable amount of time going through each well and parameter to see what is what. Attached is a Word document that summarizes my findings to date. As I continue to go through it, I am finding some areas in the document that may need to be corrected or modified, but this is what I have so far. My plan is to request exemptions from the Drinking water and Groundwater Program where I determined exemptions are warranted but where I could not find that exemptions have already been granted, along with the requested exemptions in the feasibility report. All of these exemptions will then go in the feasibility determination.

I am also in the process of reviewing the data and entering it into a spreadsheet, to run my own ACL and PAL calculations. We need at least 8 rounds of quality data, collected at least 30 days apart. As soon as I complete this part of the task, I can tell you what additional data I need, if any. We could then approve ACLs and PALs in the feasibility determination or the plan of operation. Typically it is done in the Plan of Operation.

As we discussed, the NR 140 ES and PAL for arsenic was lowered from 50 ug/L and 10 ug/L to 10 ug/L and 1 ug/L, respectively sometime around 2005. A lot of the early baseline data for arsenic used an LOD that was higher than the new PAL, and had no detections. I suspect that EPL may want to collect new data for arsenic, using a lower LOD to see if any exemptions are needed, where none were needed before. When I finish entering the data into spreadsheet I can tell you which wells EPL may want to sample for arsenic.

Regarding the rising sulfate concentrations, it appears that MW-8AR also has rising sulfate concentrations, but not as severe as some of the other wells. To summarize, below are the wells that appear to have rising sulfate concentrations:

MW-8AR
MW-16A
MW-16B
MW-120A
MW-121A

I have attached for your convenience, GEMS data showing sulfate concentrations in the gradient control system and in the leachate. As you can see, the sulfate concentrations in the gradient control system appear to be elevated; however the sulfate in the leachate does not appear to have historic high elevations. There was a recent sulfate concentration spike in the leachate; but it appears to have gone down. It appears that all of the wells listed above are located near a surface water drainage ditch, near a sed basin, or near a biofilter. MW-120A is upgradient and MW-121A is sidegradient from the landfill. As I stated on Tuesday, we ask that Veolia try to determine why the sulfate concentrations in these wells have been increasing.

Regarding wetland #7, Jennifer was out at a training today and I did not get the chance to talk with her. I have a call into her and expect to be able to talk with her tomorrow. Either her or I will then give you a call.

I hope this information is helpful.

As always, if you have any questions, please feel free to contact me.

Joe

Joe Lourigan

Hydrogeologist
Waste and Materials Management Program
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Southeast Region, Sturtevant Service Center
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Dennis Marshall - Request for more information Re.@ EPL Feasibility Report

From: "Lourigan, Joseph J - DNR" <Joseph.Lourigan@Wisconsin.gov>
To: Dennis Marshall <Dennis.Marshall@rmtinc.com>
Date: 6/26/2009 3:29 PM
Subject: Request for more information Re.@ EPL Feasibility Report
CC: "Jay.Warzinski@veoliaes.com" <Jay.Warzinski@veoliaes.com>

Hi Dennis,

I notice in the EPL feasibility report that private wells PW-4 and PW-8 are referenced on page 1-13, but I don't see them listed on table 6-6 and I don't see them located on any feasibility report plan sheets. Please add information for these two wells to the addendum.

Thanks,

Joe

Dennis Marshall - Emerald Park Landfill Supplemental Comments

From:	"Lourigan, Joseph J - DNR" <Joseph.Lourigan@Wisconsin.gov>
To:	"Warzinski, Jay" <jawarzinski@superiorserv.com>
Date:	6/5/2009 4:44 PM
Subject:	Emerald Park Landfill Supplemental Comments
CC:	"James.Dunham@veoliaes.com" <James.Dunham@veoliaes.com>, Dennis Marshall <Dennis.Marshall@rmtinc.com>, "Bekta, Ann M - DNR" <Ann.Bekta@wisconsin.gov>, "Wolbert, Brad - DNR" <Brad.Wolbert@Wisconsin.gov>, "Grefe, Robert P - DNR" <Robert.Grefe@Wisconsin.gov>, "Schultz, Frank C - DNR" <Frank.Schultz@Wisconsin.gov>, "Jerich, Jennifer K - DNR" <Jennifer.Jerich@Wisconsin.gov>, "Hartsook, Bryan D - DNR" <Bryan.Hartsook@wisconsin.gov>, "Clark, Randell V - DNR" <Randell.Clark@Wisconsin.gov>, "Wakeman, Robert S - DNR" <Robert.Wakeman@Wisconsin.gov>
Attachments:	EPL- SW Expansion Drinking Water Comments.doc; VEPL may14sitesummarymemo.doc; EPL EA Stormwater-Additional Comments-6-5-2009.doc; Picture (Metafile) 1.jpg

Drinking Water and Ground Water Program Comments:

Water Regulation and Zoning Supplemental Comments:

Storm Water Program - Supplemental Comments:

Jay,

Please find attached comments I received from the Drinking Water and Groundwater Program (DG Program), and supplemental comments received from the Water Regulation and Zoning Program and the Stormwater Program.

The DG Program recommends that the southern limits of waste be pushed north so that the limits of waste is about 400 feet north of Veolia's property line along Union Church Road. The purpose of this is to provide space between the landfill and the water supply wells located on Union Church Road, on Veolia property, for additional monitoring wells and for a groundwater remediation system if in the future one is ever needed. The existing alternative #2 appears that it may already meet this set back. The DG Program has additional recommendations to the Waste Program, including a request for a potentiometric elevation contour plan sheet for those piezometers screened in the glacial outwash sand, provided in the attached memo.

The Water Regulation and Zoning Program requests that Veolia resurvey wetlands 6, 6a and 7 because observations on May 14, 2009 did not appear to represent what is depicted on plan sheets. The purpose of the May 14, 2009 site visit was to explain the NR 103 process and to evaluate wetland quality for those wetlands that may potentially be impacted. The department can not consider wetland functional values or wetland mitigation unless it has first determined that no practicable alternative exists which avoids and minimizes wetland impacts to Veolia's preferred alternative.

The Storm Water Program has provided supplemental comments to its March 25, 2009 comments. It appears that s. NR 151.11, Wis. Adm. Code would be applicable to landfills since landfills appear to meet the definition of s. NR 151.002 (7), Wis. Adm. Code for a construction site and (22) "land disturbing construction activity". Section NR 504.09, Wis. Code may not always meet the specifications prescribed in s. NR 151.11. I believe many of the details of the stormwater controls can be worked out once a landfill footprint is determined since the landfill footprint will affect surfacewater volume discharges.

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These comments and recommendations the Waste Program received from the other department programs are not a final department decision; however, they are a significant part of our review and consideration for the overall project. I would be happy to discuss these additional comments and recommendations with you.

Sincerely,

Joe Lourigan
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Waste and Materials Management Program
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State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
Gloria L. McCutcheon, Regional Director

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April 23, 2009

FID #: 268244130
SW/CORR

Mr. Jay R. Warzinski
Veolia Inc. – Emerald Park Landfill
W124 S10629 South 124th Street
Muskego, WI 53150

SUBJECT: Letter of Incompleteness for the Veolia Emerald Park Landfill Proposed Southwest Expansion Feasibility Report (Lic#: 3290)

Dear Mr. Warzinski:

We have reviewed for completeness the report entitled "Southwest Horizontal Expansion Feasibility Report – Veolia ES Emerald Park Landfill, LLC" The report is dated January 30, 2009, was prepared by RMT, Inc., on behalf of Veolia Environmental Services (Veolia) and was received by the department on February 3, 2009.

The department also received a document entitled "Revision to Veolia ES Emerald Park Landfill, LLC, Southwestern Horizontal Expansion Feasibility Report", dated February 19, 2009 and received by the department on February 23, 2009. This document was also prepared by RMT, Inc. on behalf of Veolia and contains:

- replacement title pages for the NR 504 and NR 512 checklists
- appendix A - a missing letter that is noted on page 3 for the list of correspondence
- appendix D – a well abandonment form for PW-7
- appendix I – a signed local agreement letter from counsel for the City of Muskego

Based on our review of both documents, we have determined that the feasibility report does not contain the minimum information required by ch. NR 512, Wisconsin Administrative Code. Therefore, the report is incomplete.

Part A of this letter contains a list and explanation of the items needed to complete the report in accordance with ch. NR 512, Wis. Adm. Code, and Chapter 289, of the statutes. Part B contains a list of additional information, not specifically covered by the code or statute, but which is necessary for us to make a final determination on your proposal. Part C contains general comments which you may wish to address with the information you provide. For your convenience, we've included the reference to the applicable statute or administrative rule for each item.

Please submit this information as an addendum to your feasibility report. Be sure to provide a copy of all information submitted to the department to each recipient of the feasibility report.

Part A. Information Required to Complete the Feasibility Report:

Please provide the following items which are necessary to complete your feasibility report:

1. the Standard Notice from the Waste Facility Siting Board [NR 512.06 (d)];

2. the chemical characteristics of any high volume industrial waste anticipated to individually constitute more than 5% of the total proposed design capacity (we believe shredder fluff is one such industrial waste) [NR 512.12 (1)];

3. the miles of road and fencing that will be needed to construct, operate and maintain the site [NR 512.16 (2) (c)];

4. Social and Economic Impacts [NR 512.16 (4) (d)]:

    a. a discussion on how the landfill may affect adjacent property values and what if any assistance the landfill owner may provide or has already provided to those property owners if they can not sell their properties at fair market value (please pay particular attention to the residential properties on Union Church Drive);

    b. a discussion of how the landfill may contribute to or how the landfill may negatively impact the revenues of the local municipalities, including city and county (please also include any property tax revenue to local municipalities lost or gained on the land due to the expansion; For example, if the land were continued to be farmed how would property tax on the land as a farm compare to property tax generated from the land as a landfill?), and

    c. a discussion of how the proposed landfill expansion meets consistency with the local municipalities' (city and county) zoning and land-use plans.

5. a description of the public advisory and public opinion process taken such as any local community meetings, public notices, newspaper articles, mailings or newsletters, etc. [advisory and public opinion process, s. 289.24(1)(d), Wis. Stats.]

6. stream gauge water elevation data [NR 512.09 (4) (f)] for:
    a. SG-16
    b. SG-19
    c. Is there surface water in wetland 12 which would warrant a stream gauge?

7. a revised plan sheet 3 and 31 showing the location of SG-15.

Part B. Additional Information Necessary for Us to Make a Feasibility Determination:

1. The proposed wetland fill:

    a. Please provide more detailed information (e.g. hydrologic, biologic, etc.) regarding known and potential secondary impacts to wetlands and navigable waterways that would remain after facility construction. The information should include impacts from road and berm construction, soil stock piles, ditches, truck traffic, fence installation and any other structure or activity that may affect remaining wetlands or waterways.

    b. Please provide more detailed information regarding how Veolia plans to protect any remaining wetlands including the size of any buffer areas and erosion control measures

such as silt fencing, stone wrapped in geotextile fabric protective border, planting grass and visual inspections.

2. Practicable Alternatives Analysis (PAA) for Chapter NR 103, Wis. Adm. Code:

   a. Please amend the PAA to include a summary of adjacent off site properties and a discussion of the potential for landfill development on those sites. Please include existing conditions at those sites and any locational setbacks that may need to be met. Please explain why each adjacent property would not be a practicable alternative to the currently proposed site.

   b. Please provide a listing (address and acreage) of any other land currently owned by Veolia or any subsidiary of Veolia including land under any type of contract, located within the Emerald Park Landfill service area or any overlapping service area.

   c. Please provide further discussion on alternative no. 2.

      i. Aside from the NR 504 locational exemptions that would be needed for the limits of waste to be located within 1,200 feet from the water supply wells located on Union Church Drive, are there any other reasons why figure 3 in appendix B depicts the limits of waste for alternative 2 farther from Union Church Drive than the existing proposal?

      ii. Can the limits of waste on the east and west side of alternative 2 be adjusted to provide greater buffer to wetlands 12 and 4? If not, what would be the primary and secondary impacts (as discussed in 1. a. above) to wetlands 12 and 4 in alternative 2? How will Veolia protect the wetlands as described in 1. b. above?

3. Surface water and groundwater hydrology:

   a. Please provide a drawing detail of the biofilter design.

   b. Please provide a discussion of the existing surface water flow patterns to wetlands, streams and ponds and how those flow patterns may change in both volume and characteristics under the existing proposal. Please also consider how water from the gradient control system may affect volumes to the wetlands.

   c. Please provide monitoring information required in condition #6 of the July 29, 1999 feasibility determination to show if the goal of condition #6 is being achieved.

Condition #6 of July 29, 1999 Feasibility Determination:
(note: Superior refers to Superior Environmental Services, Inc., which owned and operated the landfill at the time the condition was written):

6. Superior shall, in the plan of operation, modify the design of the surface water management system, the closure phasing plan and, if necessary, the proposed limits of filling, to maintain 100% of the average predevelopment annual runoff to each individual wetland area analyzed in Appendix O of the Feasibility Report Addendum 2 during operation of the landfill, as well as post-closure (for Wetland 9, "predevelopment" means prior to development of the existing approved landfill; for other wetlands, "predevelopment" means prior to the development of the expansion). The goal of the surface water management system design shall be to mimic the hydrologic conditions that would naturally prevail seasonally and from year to year in each wetland in the absence of landfill development, i.e., to minimize hydrologic impacts of landfill development to the wetlands both during and after landfill development. The design shall include a monitoring program to demonstrate the effectiveness of the surface water management system in achieving this goal.

d. Please provide a response to comments made by WDNR Storm Water Engineer Bryan Hartsook contained in Attachment #1.

e. Please provide the linear feet of proposed ditch filling.

4. Physical Impacts [NR 512.16 (4) (a)]: Please elaborate on the discussion of the potential and anticipated visual impacts that the landfill and landfill features may have on neighbors around the site, in particular to the residents who live on Union Church Drive (please consider screening berms, trees, wind blown litter, dust, ability to see waste in the landfill, and landfill side slopes.) Does figure 9-1 depict several screening berms to be constructed over time at different heights as the elevation of waste increases?

Part C. General Comments:

1. Based on the PAA, it appears there may be at least one practicable alternative – alternative #2 – which provides additional waste disposal capacity and minimizes wetland and navigable stream impacts. We understand Veolia has spent a considerable amount of effort developing a potential wetland mitigation bank; however, ch. NR 103, Wis. Adm. Code does not allow the filling of wetlands if there exists a practicable alternative to avoid or minimize, or if the department determines that the activity will have a significant adverse impact on wetland functional values. Only after these criteria are satisfied, can the department consider wetland mitigation to compensate for the filling of wetlands.

2. The PAA places significant weight on the cost to construct and operate each alternative along with the economic impact each alternative may have on the company and the surrounding communities. While economics is a key factor for the company to consider, the department considers an alternative to be practicable if it is "available and capable of being implemented after taking into consideration quantifiable and verifiable information on the cost, available technology and logistics in light of the overall project purpose." The weight the department places on economic factors may vary substantially from the weight the company places on the relative economics of different alternatives. The department may consider an alternative to be practicable even if it is not the optimum alternative from an economic or profitability perspective.

3. Department staff will visit the site to conduct its own wetland functional values assessment in the near future.

4. Application to the Army Corps of Engineers (ACE): The department has requested Veolia delay submitting its application to the ACE for the proposed wetland fill, until after we can review an amended PAA so that the application to ACE contains a proposal which is consistent with the department's determination.

5. Relationship between the requested s. NR 504.04 (3) (f), Wis. Adm. Code exemptions for water supply wells located within 1,200 feet of the proposed limits of waste and the requirements of s. NR 812.08 (4) (g) 1, Wis. Adm. Code:

   The well owner for each well or Veolia will need to submit a request for a variance from s. NR 812.08 (4) (g) 1, Wis. Adm. Code, under the provisions of s. NR 812.43, Wis. Adm. Code. The department's Waste and Materials Management Program will review the requested NR 504 exemptions as part of its feasibility review and the Drinking Water and Groundwater Program will review the NR 812 variance requests. Our individual programs work together on the review of these requests, but we ask that Veolia hold off on submitting the NR 812 variance requests until such time that both reviews can occur with the same or nearly the same timeline for a decision. We believe this will help provide a more consistent review and decision on both code requests. We will notify Veolia when we believe the best time is to submit the NR 812 variance requests.

   Please note that if the Department determines that the NR 504 exemptions can not be granted, this may affect the NR 103 practicable alternatives analysis.

6. Soil Borrow:

   The feasibility report does not contain modified proctor and moisture density tests and hydraulic conductivity tests on samples taken from same locations as required by NR 504.075(5), see page 13-2 of feasibility report. Because there is some detailed, specific knowledge of the soil at this site, these tests and information can be provided in the Plan of Operation Report. Please note, this does not waive the required code specifications on the soil that need to be met for clay liner and cap construction.

7. Veolia is requesting approval for a 10% overfill during landfill operation to account for settlement. In the past, the department has allowed only 5%.

8. The traffic study contained in appendix K is 12 years old and may no longer represent existing conditions. However, the department has notified the Wisconsin Department of Transportation (WDOT) of the landfill feasibility report and will provide notification to the WDOT when the public comment period begins.

This incompleteness determination is not a denial of your proposal, but indicates that additional information is needed for us to continue our review. Submittal of this information does not ensure approval nor does it preclude us from requiring additional information if continued review indicates it is needed.

If you have any questions regarding this determination, please contact Joe Lourigan, hydrogeologist at (262) 884-2347.

Sincerely,

JL for Franklin C. Schultz

Franklin C. Schultz, Supervisor
Waste and Materials Management Program
Southeast Region, WDNR

c:
Dennis Marshall, RMT, Inc.
Brad Wolbert, WA/3 (electronic copy)
Ann Bekta, WA/SCR - Janesville (electronic copy)
Jennifer Jerich, WT/SER - Waukesha (electronic copy)
Robert Wakeman, WT/SER - Waukesha (electronic copy)
Jo-Walter Spear, J. Spear and Associates (electronic copy)
Charlene LeMoine, Waukesha Environmental Action League (electronic copy)
Joe Lourigan, WA/SER-Sturtevant
SER File

It appears that the storm water management at the proposed expansion must comply with chs. NR 216 and NR 504.09, Wis. Adm Code. The proposed landfill expansion is **not required to meet NR 151 post-construction performance standards** for storm water runoff because there will be no additional impervious surfaces constructed as a result of the project. The requirements considered for applicable post-developed construction sites include the following:

- *Peak discharge control* – Maintain pre to post 2 year, 24 hour design storm runoff volumes
- *TSS reduction* – Remove suspended solids by 80% in the post-developed condition as compared to no controls
- *Infiltration* – Infiltrate 25% of the 2 year, 24 hour runoff volume or 90% of the pre-developed volume infiltrated based on an average annual rainfall
- *Protective areas* – Minimize construction of impervious surfaces within specified setbacks from waterways and wetland to the maximum extent practicable. Storm water BMPs can be located within an NR 151 protective area.

Water Quality Control

There are 4 new sedimentation basins proposed and 1 expansion. The storm water calcs provide the pre-developed and post-developed runoff volumes and discharge rates for each proposed basin. The storm water runoff calculations show there is a substantial discharge increase for all basins in the post developed condition and are represented as follows:

Proposed Sediment Basin	Pre-Developed Discharge Rate (cfs)	Post-Developed Discharge Rate (cfs)
Outfall 7	2.34	19.69
Outfall 8	1.42	9.30
Outfall 9	5.17	20.65
Outfall 10	8.51	13.52
Expansion 1	7.72	13.69

Each of these basin outfalls discharge to adjacent wetland complexes. Although the peak discharge requirement in NR 151 is not applicable for this site, there is a high potential for downstream erosion due to the increased flows. The basin geometry and outlet structures should be reevaluated to reduce the discharge rates to meet pre-developed conditions.

Additionally, there is a net increase in surface water runoff volume to each of the receiving wetland complexes (Wetland 4, Wetland 10, and Wetland 11). There is a net decrease in runoff volume to Wetland 9. The inundation depth and period should be evaluated in Wetlands 4, 10, and 11 to ensure no secondary impacts will result from the increased runoff volumes. Conversely, Wetland 9 should be evaluated to ensure no secondary impacts will result from decreased runoff volumes (hydraulic starvation).

The runoff volumes were calculated assuming a 2.7" rainfall event for the 2 year, 24 hour event. **This is the incorrect rainfall depth.** The rainfall depth provided by SEWRPC for the 2 year, 24 hour event is 2.57". A re-run of the hydraulic model using the correct rainfall depth will show decreased volumes and discharge rates, but will not likely be sufficient to meet pre to post-developed discharge rate requirements.

Water Quality Control (TSS Reduction)

The storm water calculations reveal that the basins are under-designed for the level of treatment needed for 1) To maintain effectiveness of biofilter devices and 2) To ensure water quality in

receiving wetlands and waters of the state. **I recommend that each of the proposed basins and the Sediment Basin 1 expansion be designed to remove total suspended solids (TSS) by 80% as compared to no storm water controls in the pre-developed condition.** Section 9 of the Expansion Feasibility Report indicates that the basins were designed to settle a **15 micron particle during a 2 year, 24 hour runoff event.** There are two problems with this proposal:

1) Per WDNR Technical Standard 1001 for Wet Detention Basins, the treatment surface area of the pond can be designed to meet desired percent TSS reduction based on the particle settling velocities of representative soil textures. For 80% control, the 3 micron particle must be settled out; for 60% control, the 6 micron particle must be settled out; and for 40% control, the 12 micron particle must be settled out.
2) The treatment surface area needed is determined by using the appropriate particle settling velocity and the proposed peak outflow from the basin resulting from a 1 year, 24 hour event, which is 2.1". The water quality calculations included in the report assumed a rainfall depth of 1.95" (the SEWRPC recommended rainfall design depths for a 2 year, 6 hour event).

The treatment surface area of the permanent pool for each of the basins should be designed at least to settle the 6 micron particle for 60% control and the correct rainfall design depth should be routed through the basins. The increase in runoff volumes will effect the pollutant removal efficiency of the basins.

The following statement is made in Section 9.11.4 of the Feasibility Report:

"The emergency spillway will be designed to pass a 100 year storm event, and the basin will dewater in no less than 3 days."

This is an indication that the basins may be designed as dry detention. Currently, there is no TSS removal credited for dry detention basins.

b.) Identification of storm water regulations that must be followed

As stated previously, NR 151 post-construction performance standards are not applicable to this site due to no net increase in impervious surface. However, best management practices must be implemented during grading activities to provide sediment and erosion control. Any BMPs used must be implemented per WDNR Technical Standards.

The following is a list of considerations for construction of the storm water control features:

1) The plan proposes construction of diversion swales to construct runoff to treatment BMPs, identified as sedimentation basins. The swales must be graded to provide positive drainage to the basins and vegetation within swales must be maintained to provide as much filtration of suspended solids as possible. Swales must be stabilized immediately following construction with topsoil, seed, and erosion matting which meets WDNR Technical Standard 1053 for Channel Erosion Mat. Once there is a stabilized conveyance established to the COMPLETED basins, grading of the proposed area can commence.
2) The sedimentation basins must be sized and designed to meet WDNR Technical Standard 1001 for Wet Detention Basins. To prevent groundwater contamination, all wet basins must be lined with a 2' clay liner or an HDPE liner that meets the criteria listed in Appendix D of the standard. This will also ensure that a permanent pool is sustained.
3) The proposed basins should be constructed to maximize a permanent pool depth of 5'. This allows for 2' of sediment storage, and 3' of permanent pool to prevent scour and resuspension of settled particles.

4) The slopes of the proposed landfill expansion are 3:1. A WisDOT approved erosion matting on the Product Acceptability List (PAL) must be used to stabilize these side slopes. A Class I Type A matting will suffice for slopes flatter than 2.5:1. Seed with properly anchored mulch (either crimped or tackified) will only suffice for 3:1 slopes less than 60' long.

Construction Concerns

- A construction sequence must be included specifying the complete construction of all diversion swales and basins prior to commencing mass grading activities. The sequence must also specify interim stabilization measures for each major land disturbing activity.
- Minimize total area of disturbance at given time by phasing areas and providing temporary conveyances to outfall controls. This may be a component of the construction means and methods on site.
- The proposed basins appear to be way under-designed to serve as a sedimentation basin during construction. Each of the basins should be reevaluated for the ability to serve as a sediment basin for construction runoff from Type C soils. Per WDNR Technical Standard 1064 for Sediment Basins, the following equation must be satisfied assuming the peak outflow is calculated from the 1 year, 24 hour event:

  Treatment Surface Area (S_a) = 1.2 * (Q_{out}/V_s)
  where V_s = particle settling velocity of Type C soils = $1.2x10^{-5}$ fps
- A site-specific erosion control plan should be prepared for the project

5) Recommendations for storm water monitoring.

- During construction, weekly and post- half inch rainfall event erosion control inspection should be completed and repairs should be made as necessary within 24 hours
- Biofilter basins should remain off-line until contributing drainage area has reached final stabilization. Either bypass flows from basins or construct biofilters after project is completed. This will prevent premature clogging due to excess sedimentation from construction runoff.
- A long-term maintenance agreement should be drafted for each of the storm water management facilities, including the swale conveyances. The agreements should define the practice, provide a maintenance schedule, identify responsible parties, and identify inspection frequency.